The Chicago Section of the society held its winter meeting at Columbus, Ohio, in affiliation with the American Association for the Advancement of Science. The next meeting of the society will be held at Columbia University on February 26.

F. N. COLE,
Secretary

SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 545th meeting of the society was held in the Assembly Hall of the Cosmos Club, Saturday, November 20, 1915, called to order by President Bartsch, with 50 persons present.

On recommendation of the council Leo D. Miner, E. O. Wooten, A. M. Groves, all of Washington, D. C., were elected to active membership.

Under the heading Brief Notes, Mr. Radcliffe called attention to recent efforts of the Bureau of Fisheries in rearing shad in ponds. Young fish thus raised attained twice the size of those of the same age in their natural environment. Specimens of both kinds were exhibited.

The first paper of the regular program was by Frederick Knab, "The Dispersal of Some Species of Flies." Mr. Knab said: "The species of Diptera that have been spread beyond their natural habitats through the agency of man are for the most part such as thrive under conditions created by man, many of them having even become his inseparable associates. They are mostly scavengers whose larvæ thrive in spoiled foodstuffs, sewage and excrement of man or domestic animals. The majority of the flies of such habits occurring in North America are unintentional introductions from Europe. It is certain that many other species of flies must have been carried across the ocean repeatedly and yet failed to establish themselves. It is only those species which upon their arrival find conditions suitable for propagation immediately at hand that can be expected to gain a foothold, and most of these will be scavengers. A few striking examples of the wide dissemination of such species by man were given.

"A notable case is the very wide distribution of *Eristalis tenax*, the drone fly, within very recent times. Its natural habitat was Europe, northern Africa and the temperate portions of Asia. It appears to have been first noted in the United States about 1870 and in the course of a decade had spread over the whole country and become abundant everywhere. Osten Sacken already pointed out that its sudden spread was only possible 'when the necessary conditions for its existence (drains, cesspools, sewers, etc.) had been gradually introduced by civilization across the immense plains which separate the Pacific from the Atlantic Ocean.' Most remarkable is that this fly made its appearance in New Zealand in 1888, where the following year it was abundant in both islands. In America and elsewhere *Eristalis tenax* has not invaded the tropics. In North America it ranges southward on the Mexican tableland to Mexico City and even to Orizaba at the edge of the tropical belt. But in the temperate southern portion of South America it has become established with the recent more general settling up of that region. It was first noted at Buenos Aires about 1895 and is now abundant and generally distributed to the Chilean coast. It has become introduced in Cape Colony and the Hawaiian Islands, the records for the latter going back to 1892. It is also established in southern Australia and appears to have been common about Sydney as early as 1892.

"A second species, *Eristalis arbustorum*, has recently become introduced into the United States from Europe. Like the other, it is a sewage breeder. It was first noticed about New York City in 1906 and has already spread westward through Ohio.

"Another recent importation from Europe is the ortalid fly, *Chrysomyza demandata*. This species breeds particularly in horse manure. It was first found in Philadelphia in 1897 and is now distributed over the whole United States.

"Less known are the species which have become cosmopolitan within the tropics, but do not invade the colder portions of the temperate zone. *Volucella obesa* is a large green syrphid fly of scavenger habits. Its original habitat was tropical America, but now it is generally distributed through the tropics of the Eastern Hemisphere, occurring even on remote islands, like Hawaii and Guam.

"A minute fly of the family Borboridæ, *Leptocera punctipennis* Wied. (*Borborus venalicius* O. S.) is similarly distributed. Osten Sacken, who knew of its occurrence in Africa and Cuba, suggested that it may have been brought to America by slave ships. This theory appears plausible, as it has since been determined that this fly breeds particularly in human feces deposited in the open. During the Spanish-American war it appeared in numbers at Miami, Florida, about the military camp, and where, no doubt, the conditions just indicated

existed. It has not been reported from there since, although the locality is often visited by entomologists.

"*Chrysomyza œnea,* a fly common in the Orient and breeding especially in manure, is of particular interest on account of its very recent appearance within the United States. It was first found in August of this year and so far only in one locality in Louisiana. It appears to have been established in Brazil for some time and very likely occurs in intervening territory, although we have no information on this latter point.

"Another cosmopolite of tropical and semi-tropical distribution is *Milichiella lacteipennis,* a minute fly of the agromyzid series. This also, there is good reason to believe, is a manure breeder.

"A limited number of species are disseminated through both temperate and tropical regions. The house fly, stable fly and certain species of *Drosophila* will at once come to mind as faithful companions of man everywhere. Most remarkable, there is in this category a minute and very frail fly of the family Psychodidæ, *Psychoda alternata.* The flight of this mere mote is exceedingly weak and it clings to sheltered situations. It breeds particularly in sewage and often occurs in sewers in countless numbers. This fly has been received or reported from Europe, North Africa, the United States, Mexico, Guiana, Chile, Hawaii, India and Australia, and no doubt it occurs whenever a sufficiently dense population supplies the requisite conditions."

The second paper was by Alex. Wetmore, "Notes on the Habits of the Duck Hawk." Mr. Wetmore said: "In observations made on the Bear River marshes, Great Salt Lake, Utah, it was found that duck hawks do much of their hunting for food in early morning. Later in the day they pursue any flying bird merely for the pleasure of the chase, seldom killing." Several incidents illustrating this were related.

The last paper of the evening was by Elmer D. Merrill, "Geographic Relationships of the Philippine Flora." Mr. Merrill based his conclusions after the examination of large numbers of living and herbarium specimens from the Philippine Islands, the Malayan Archipelago, the Asiatic mainland, Celebes, New Guinea, Australia, etc. The speaker discussed, in a general way, the geographic position of the Philippine Archipelago with reference to surrounding land areas and the general character of the flora, calling attention to the fact that the vegetation is dominantly Malayan. The probable condition of the vegetation before the advent of man in the Archipelago was a continuous primeval forest. Hence in discussing geographic relationships of the flora, the vegetation of the settled areas and open country generally must be excluded from consideration as presenting special alliances. Likewise the coastal vegetation must be ignored, the species being practically all disseminated by ocean currents. Serially the speaker discussed the striking Asiatic elements in the flora of north central Luzon, largely continental and especially Himalayan foothill types; the weak special alliances of the Sunda group of islands, especially Borneo; the remarkably strong evidences of relationship with the Molucca Islands, especially Celebes, to the south; New Guinea; the numerous Australian (Queensland) types; New Zealand, and Polynesia. The botanical evidence points to weak connections in past ages with Borneo and the Sunda Islands, but to strong or longer continued connections with the islands to the south and southeast. Without such conections to the south and southeast it is practically impossible to explain the strong special alliances of the flora to that of the above regions. That the Philippines and the islands to the south and southeast may have at one time formed the eastern boundary of an ancient continent seems to be probable from the present floristic elements found in the archipelago. It is clear, however, from the remarkably high percentage of endemism as to species (over 50 per cent.) that the islands have been separated long enough to allow for the development of a characteristic flora as to species, but not long enough to develop many distinct genera, the percentage of endemism as to genera being but a fraction of one per cent.

The speaker called attention to the fact that conclusions regarding special alliances of the Philippine flora may be invalidated as exploration progresses, as the floras of Sumatra, Borneo, the Moluccas, and New Guinea, are, comparatively speaking, very imperfectly known, in the case of each probably not more than one third of the species being known, and in some cases even less.

In the discussion which followed Mr. Wm. Palmer, Dr. Stejneger, Dr. Lyon, and Dr. Bartsch discussed the geographic distribution of the Philippine birds, reptiles, mammals and mollusks, which in many respects showed a lack of correlation with the flora, though agreeing in many essentials.

The society adjourned at 10:30 P.M.

M. W. Lyon, Jr.,
Recording Secretary